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GB 1149042  
GB 1132065  
GB 1041003  
GB 914213  
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- (71) Applicants  
Unisearch Limited,  
221-227 Anzac Parade,  
Kensington, New South  
Wales, Australia

- (72) Inventors  
Alexander Eric Churches  
Gabriel Antony
- (74) Agents  
Urquhart-Dykes & Lord,  
11th Floor, St. Martin's  
House, 140 Tottenham  
Court Road, London. W1P  
0JN.

(54) Infusion device

(57) An infusion device suitable for subcutaneously or intravenously supplying medication, and which is lightweight and readily portable, comprises a container 1 for a sachet containing liquid medication which is collapsible within the container under the action of mechanical means.

In the Figure, the sachet (not shown) is collapsed by a coil spring 2 acting on a lever 3', 3'', and is positioned under the lever arm 3'. The lever arm 3' moves across a window (not shown) to indicate the amount of liquid medication left in the sachet. The contents of the sachet are dispensed through outlet nozzle 5.

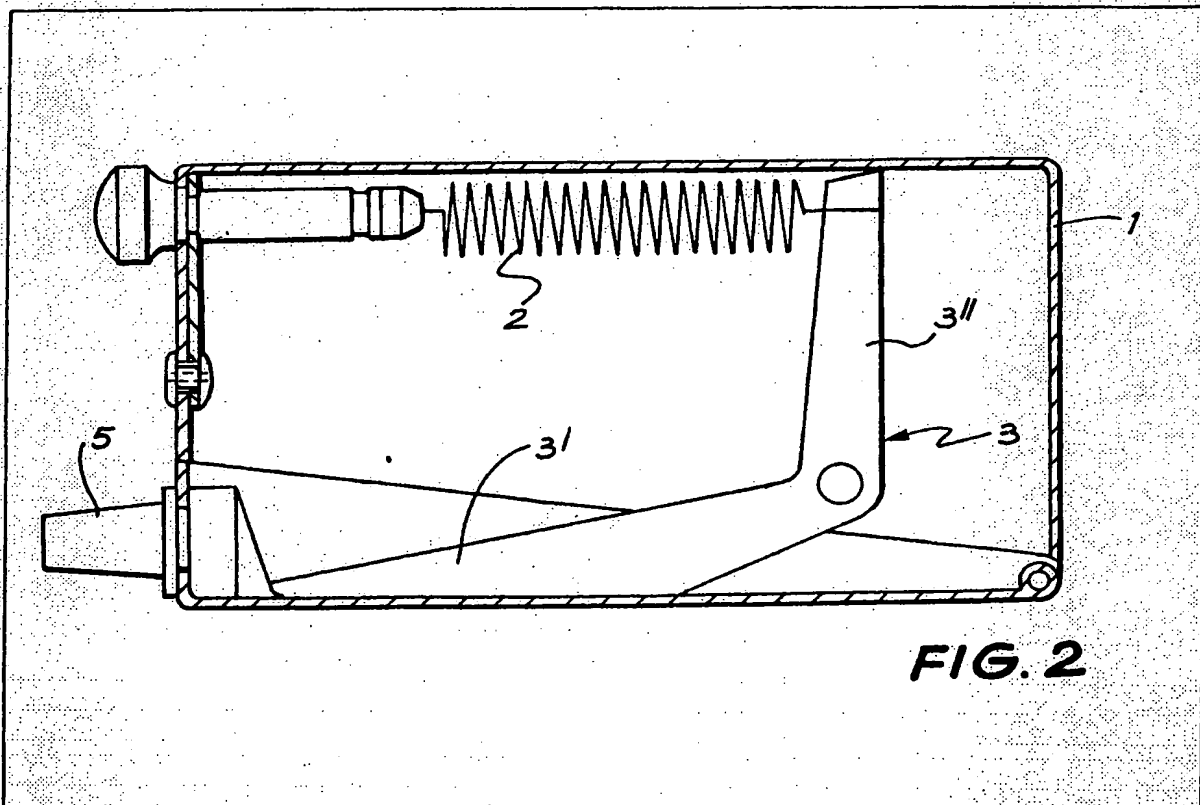


FIG. 2

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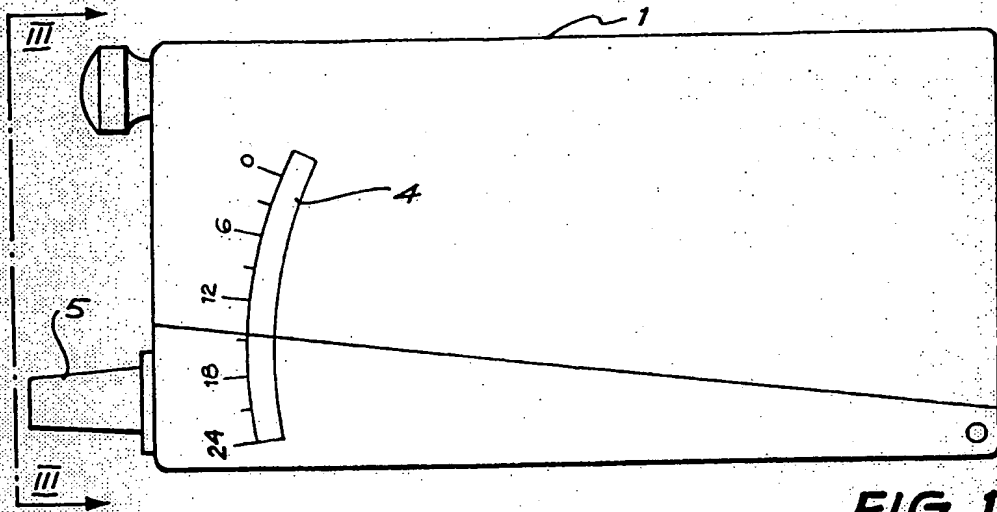


FIG. 1

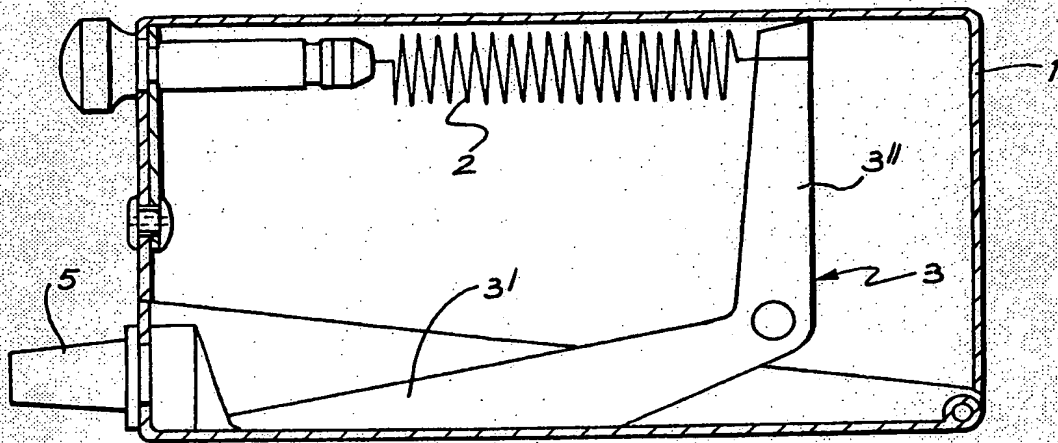


FIG. 2

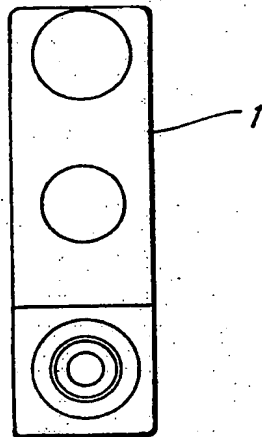
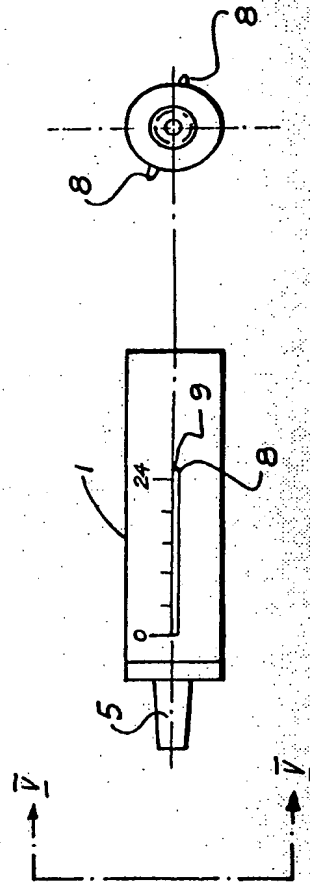
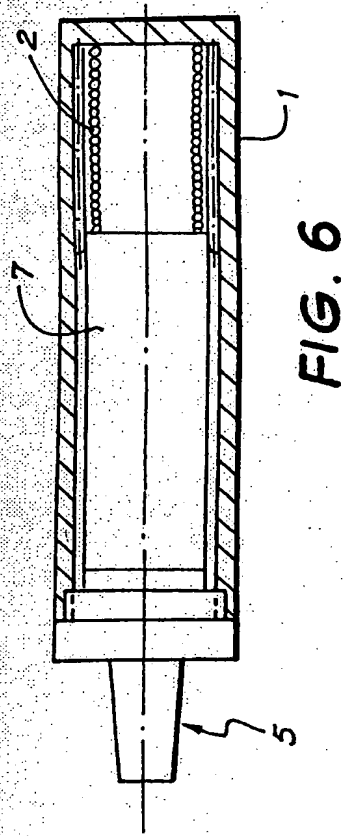


FIG. 3

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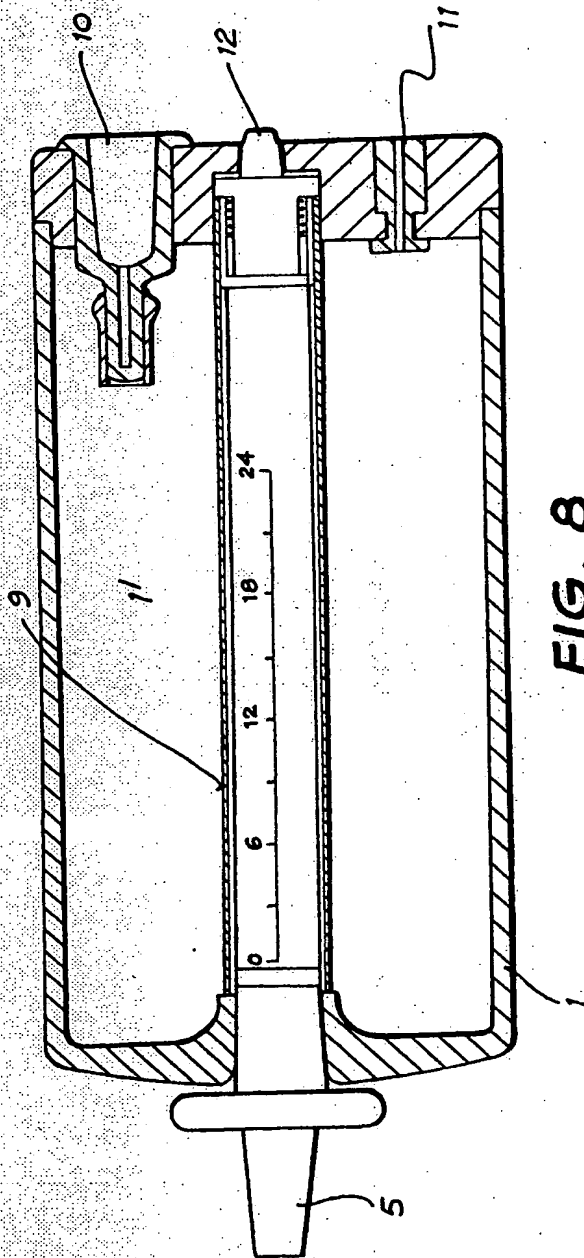


FIG. 8

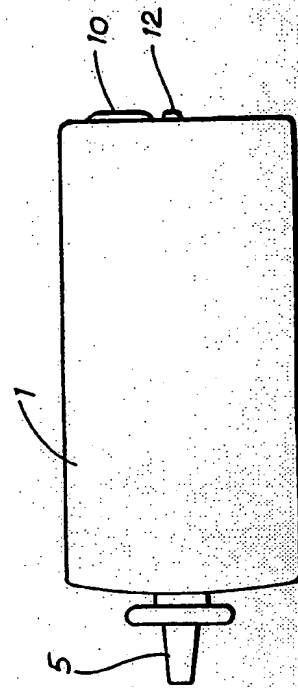


FIG. 7

## SPECIFICATION

## Infusion device

5 The present invention relates to infusion devices and more particularly to medical infusion devices for supplying metered amounts of a liquid medication over a prolonged period of time.

10 Infusion devices are known but prior art constructions have been bulky and inconvenient and have required electrical power supplies, usually in the form of a battery, to a motor drive. It is an object of the present invention to provide an infusion device which can be made small enough to be convenient  
15 for the user which in the case of a medical patient may be a child, to carry or wear for extended periods. In this regard the present invention is applicable to use in the treatment of endocrine disorders such as diabetes, where daily injections of insulin  
20 are the normal means of treatment; or for, say, opiate infusion to terminal cancer patients.

In one form the present invention provides an infusion device comprising, a housing for containing a renewable collapsible liquid containing sachet,  
25 reloadable mechanical means operable to collapse said liquid containing sachet when in situ, and outlet means for delivery of the liquid contents of the sachet when acted upon by the mechanical means.

The reloadable mechanical means preferably  
30 takes the form of a spring force or gas pressure whereby when a sachet containing, say, a day's supply of medication is fitted it is slowly squeezed to deliver the medication via a hypodermic fitting. The supply rate may be controlled by a porous metering  
35 nozzle under constant pressure or by a mechanism driven at a constant rate.

Embodiments of apparatus of the invention will now be described by way of example with reference to the accompanying drawings, in which:—

40 Fig. 1 is a view of a first embodiment of an infuser in accordance with the invention;

Fig. 2 is a cut-away view showing the inner workings of the device of Fig. 1;

Fig. 3 is a view III-III of the device of Fig. 1;

45 Fig. 4 is a view of a second embodiment;

Fig. 5 is the view V-V of the Fig. 4 embodiment;

Fig. 6 is an enlarged cut-away view of the embodiment of Fig. 4; and

Fig. 7 is an external view of a third embodiment in  
50 accordance with the invention; and

Fig. 8 is a cut-away view of the embodiment of Fig. 7 to an enlarged scale.

In the embodiments shown there are two spring force operated infusers (Figs. 1-6) and one gas pressure operated infuser (Figs. 7, 8).

55 The infuser of Figs. 1-3 comprises a housing 1 containing a resettable coil spring 2 acting upon one end of a pivoting lever 3. There is a window 4 provided in the housing 1 which displays calibrated settings  
60 denoting the extent of the supply of medication remaining to be dispensed at any time during its operation. The amount of remaining supply being

denoted by the position of the lever arm 3' as it passes across the window 4, during collapsing of a sachet (not shown) positioned under the lever arm 3'.  
65 The contents of the sachet being dispensed via outlet nozzle 5.

In Figs. 4-6 like numerals indicate like components as per the embodiment of Figs. 1-3. It will be noted  
70 that in this case the spring 2 acts directly upon the exterior of the sachet 7. In this embodiment the spring 2 is fitted with a locking device or tab 8 so that the infuser can be loaded and stored ready for use which is accomplished by unlocking the tabs 8 from  
75 their complementary recesses 9 in the housing.

Figs. 7 and 8 show an embodiment of a gas pressure operated infuser comprised of a housing 1 and a tube 9 for containing a collapsible sachet and a  
80 containment volume 1' to be filled with gas under pressure which acts upon the sachet to expel its contents through nozzle 5. The containment volume is pressurized, when the sachet has been fitted, via an inlet valve 10. The volume can only be pressurized to a predetermined level as pressure control valve 11  
85 operates at that predetermined pressure. If, at any time, it is desired to disconnect the infuser the gas pressure within may be released by operating relief valve 12.

Metering of the outflow of medication in all these  
90 embodiments may be provided by a porous metering membrane or other porous medium located within the outlet nozzle or by an additional metering device remote from the infuser.

The porous nozzle may be either a part of the sachet or part of the infuser, to be thrown away after a  
95 day's use or re-used, respectively. Where the sachet is provided already loaded with a sterile medication and complete with its own nozzle and a fitting to attach directly to a hypodermic tube, the complete  
100 sachet may be disposed of and replaced by a fresh sachet complete with its own metering membrane when the first sachet has been emptied.

It will be appreciated that the foregoing embodiments which describe the present invention in relation to medical application are not to be limiting  
105 upon the broadest form of the invention which is applicable to other fields as will be appreciated by the addressee.

## CLAIMS

110 1. An infusion device comprising, a housing for containing a renewable collapsible liquid containing sachet, reloadable mechanical means operable to collapse said liquid containing sachet when in situ, and outlet means for delivery of the liquid contents  
115 of the sachet when acted upon by the mechanical means.

2. An infusion device as claimed in claim 1, wherein the reloadable mechanical means comprises a spring.

120 3. An infusion device as claimed in claim 2 further comprising lever spring, which lever means are operated by the spring to apply collapsing force to a sachet when in situ.

4. An infusion device as claimed in claim 2

wherein the housing is a tubular member having a coil spring located therein, means protruding from the housing to compress the spring and retain it in its compressed condition ready for release when a sachet has been fitted.

- 5 An infusion device as claimed in claim 1 wherein the reloadable mechanical means comprises a rechargeable gas pressure cylinder within the housing or a replaceable pressure cylinder adapted to be fitted in the housing.

- 10 6 An infusion device as claimed in any one of the preceding claims comprising a metering nozzle for controlling the outflow from the sachet when in use.

- 7 An infusion device substantially as herein  
15 before described with reference to the accompanying drawings.

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